

What is claimed is:

1. A method for determining oil content of a seed comprising:

extracting oil from a seed using a solvent;

evaporating said solvent in a stream of gas to form oil particles;

5 directing light into said stream of gas and said oil particles, thereby forming reflected light;

detecting said reflected light; and,

determining said oil content based on said reflected light.

10 2. The method of claim 1, wherein said seed has a mass of less than 100 micrograms.

3. The method of claim 1, wherein said seed has a mass of less than about 50 micrograms.

15 4. The method of claim 1, wherein said seed has a mass of less than about 25 micrograms.

5. The method of claim 1, wherein said solvent comprises an organic solvent.

20 6. The method of claim 1, wherein said solvent comprises a nonpolar solvent.

7. The method of claim 1, wherein said solvent is selected from the group consisting of hexane, petroleum ether, alcohol, decane, and acetonitrile.

25 8. The method of claim 1, wherein 0.5 to 50 mL of said solvent is used.

9. The method of claim 1, wherein 1 to 3 mL of said solvent is used.

10. The method of claim 1, wherein said evaporating is done in an evaporative light scattering detector.

11. The method of claim 1, wherein said stream of gas comprises nitrogen.

12. The method of claim 1, wherein said solvent is introduced into said stream of gas at a rate between 0.3 and 5 milliliters per minute.

13. The method of claim 1, wherein said light is laser light.

14. The method of claim 1, wherein said detecting said reflected light is done with a silicon photodiode.

15. The method of claim 1, wherein said stream of gas is heated.

16. The method of claim 1, further comprising separating said seed from said solvent after said extracting.

17. The method of claim 16, wherein said separating comprises centrifugation.

18. The method of claim 1, further comprising introducing said solvent into a second solvent prior to said evaporating.

19. The method of claim 1, wherein said method is performed in less than 6.5 minutes.

20. The method of claim 1, wherein said method is performed in less than 1.5 minutes.

21. The method of claim 1, wherein said seed is maize.

22. The method of claim 1, wherein said seed is soybean.

5 23. The method of claim 1, wherein said seed is rapeseed.

24. A method for determining oil content of a seed comprising:

extracting oil from a seed using a solvent;

separating said solvent from said seed;

10 evaporating said solvent in a stream of gas to form oil particles;

directing light into said stream of gas and said oil particles, thereby forming  
reflected light;

detecting said reflected light; and,

determining said oil content based on said reflected light.

15 25. The method of claim 24, further comprising introducing said solvent into a second  
solvent prior to said evaporating.

26. The method of claim 24, wherein said separating comprises centrifugation.

20 27. A method for determining oil content of a seed comprising:

disrupting said seed to produce ground seed;

extracting oil from said ground seed using a solvent;

evaporating said solvent in a stream of gas to form oil particles;

25 directing light into said stream of gas and said oil particles, thereby forming  
reflected light;

detecting said reflected light;

determining said oil content based on said reflected light.

28. The method of claim 27, further comprising introducing said solvent into a second solvent prior to said evaporating.

29. The method of claim 27, wherein said disrupting comprises grinding.

30. A method for determining oil content of an agricultural material, comprising:

extracting oil from said material using a solvent;

evaporating said solvent in a stream of gas to form oil particles;

directing light into said stream of gas and said oil particles, thereby forming reflected light;

detecting said reflected light; and,

determining said oil content based on said reflected light.

31. A method for determining oil content of a batch seed sample, comprising:

extracting oil from said batch seed sample using a solvent;

evaporating said solvent in a stream of gas to form oil particles;

directing light into said stream of gas and said oil particles, thereby forming reflected light;

detecting said reflected light; and,

determining said oil content based on said reflected light.

32. A method for selecting a seed having an enhanced oil content, comprising:

extracting oil from a seed using a solvent;

evaporating said solvent in a stream of gas to form oil particles;

directing light into said stream of gas and said oil particles, thereby forming  
reflected light;

detecting said reflected light;

determining said oil content based on said reflected light; and,

5 selecting a seed with a similar genetic background to said seed based on said oil  
content.

33. A method according to claim 32, further comprising germinating said seed with a  
similar genetic background.

10 34. A method according to claim 32, further comprising placing in a container said  
related seed.

35. A method of introgressing a trait into a plant comprising:

15 extracting oil from a seed using a solvent;

evaporating said solvent in a stream of gas to form oil particles;

directing light into said stream of gas and said oil particles, thereby forming  
reflected light;

detecting said reflected light;

20 determining said oil content based on said reflected light;

selecting a seed with a similar genetic background to said seed based on said oil  
content;

growing a fertile plant from said related seed; and,

utilizing said fertile plant as either a female parent or a male parent in a cross with

25 a second plant.

36. A method according to claim 35, further comprising selecting a progeny of said cross having said trait.

37. A method according to claim 35, wherein said fertile plant is said male parent to said cross.

38. A method according to claim 35, wherein said fertile plant is said female parent to said cross.

39. A method according to claim 35, wherein said plant is selected from the group consisting of alfalfa, apple, banana, barley, bean, broccoli, castorbean, citrus, clover, coconut, coffee, maize, cotton, cucumber, Douglas fir, Eucalyptus, Loblolly pine, linseed, melon, oat, olive, palm, pea, peanut, pepper, poplar, Radiata pine, rapeseed, rice, rye, sorghum, Southern pine, soybean, strawberry, sugarbeet, sugarcane, sunflower, sweetgum, tea, tobacco, tomato, turf, and wheat.

40. A method according to claim 35, wherein said plant is selected from the group consisting of cotton, maize, soybean, rapeseed, rice, and wheat.

41. A method according to claim 35, wherein said plant is maize.

42. A method according to claim 35, wherein said plant is soybean.

43. A method according to claim 35, wherein said plant is rapeseed.

44. A method for determining oil content of a seed comprising:  
extracting oil from a seed using a solvent;

nebulizing said solvent and said oil under high pressure into a device capable of  
evaporating said solvent;

evaporating said solvent in a stream of gas in said device to form oil particles;

directing light into said stream of gas and said oil particles, thereby forming

5 reflected light;

detecting said reflected light;

determining said oil content based on said reflected light.

45. A method for selecting a seed having an enhanced oil content, comprising:

10

a) extracting oil from a seed using a solvent;

b) evaporating said solvent in a stream of gas to form oil particles;

c) directing light into said stream of gas and said oil particles, thereby forming

reflected light;

d) detecting said reflected light;

15

e) determining said oil content based on said reflected light;

f) repeating steps a) through e) one or more times, and,

g) selecting one or more seeds based on said oil content.

20

*add  
a8*